Climate Change and Its Impact on Infrastructure Systems in the Midwest

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Report Summary

The lifeblood of a community is its infrastructure system. In light of Hurricanes Harvey, Irma, and Maria – which are only the most recent examples of extreme weather events to affect the nation – the Midwest Economic Policy Institute (MEPI) has examined the anticipated impact climate change will have on the Midwest in its newest report.

Climate change is observable in the Midwest.

- The Midwest is home to over 61 million people and an expansive transportation network that supports $2.6 trillion in regional gross domestic product.
- The average air temperature in the Midwest increased by 4.5 degrees from 1980 to 2010.
- The percent of days with "very heavy precipitation" has increased by 27 percent in the Midwest since the late 1950s.
- The Great Lakes have experienced less ice coverage, leaving lakeshores susceptible to flooding and erosion.

Climate change-caused damage to transportation systems could result in economic losses.

- Extreme weather conditions will negatively impact the physical conditions of existing infrastructure and increase maintenance costs.
- Increased heat will reduce the life of asphalt, add stress to expansion joints for bridges and highways, cause pavements and railways to buckle, and affect aircraft performance.
- Flooding will weaken structural supports for bridges, deteriorate soil that supports infrastructure, shorten the lifespan of pavement, and increase sedimentation in waterways.
- Damage to significant freight routes or hubs, such as those in Chicago and across the Midwest, would require trade flows to shift, imposing significant economic costs.

The production and distribution of energy can be significantly impacted by climate change.

- The Midwest is a net distributor of electricity to other regions.
- Flooding, high winds, ice, snow, and storms can damage facilities and above-ground transmission lines across the Midwest.
- The Midwest is particularly susceptible to electricity outages, with four states ranking among the top 10 states that experienced the most outages between 2003 and 2012.
- Rising temperatures caused by climate change have led to increased demand for cooling and will require $6 billion in future investments to keep up with the region's needs.

Midwestern states must plan and design infrastructure to address climate change.

- Minnesota and Michigan lead the Midwest in adequately preparing their systems for the effects of climate change, evident by their adoption of Climate Action and Adaptation Plans.
- The state Departments of Transportation in Illinois, Michigan, Ohio, and Minnesota have all pursued asset management programs to address climate change and assess vulnerabilities.
- In transportation projects, climate change can and should be accounted for through the rainfall and heat standards used in the design process.
- New public infrastructure and private developments should be limited or prohibited in unsafe areas that have already experienced weather-related damage.

No one policy or action alone will halt the harmful effects of climate change. While some Midwestern states have taken actions to address negative impacts on infrastructure systems, more needs to be done. As infrastructure investments continue to be debated, climate change and its impact on these systems must also be considered.